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7590

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EXAMINER

TRAN, BINH X

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/010,548

Applicant(s)

YEOM ET AL.

Examiner

Binh X Tran

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1-6) in Paper No. 6 filed on 8-1-2003 is acknowledged. The applicants cancelled claims 7-17 in the same paper, thus no claim was withdrawn from further consideration.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Albridge Jr. et al. (US 4,775,789).

Albridge Jr. discloses a method comprising:

extracting an ion beam from an ion source to accelerate the ion beam;

reflecting an accelerated ion beam by a reflector to neutralize ion beam (Fig 1-6, col. 3-5);

positioning a substrate to be etched (32) in a path of a neutral beam to etch a material layer on the substrate (Fig 6, col. 6 lines 1-10).

Albridge Jr. does not explicitly disclose that the ion beam has a predetermined polarity. However, Albridge clearly discloses that the ion beam has positive. Polarity of a beam is the property of the beam itself. According to MPEP 2112.01, products of

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identical chemical composition cannot have mutually exclusive properties. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. The examiner will interpret that a positive charge beam must inherently have some polarity value.

Respect to claim 2, Albridge Jr. teaches to adjust the angle of incidence of the ion beam on the reflector before the reflecting (col. 3 lines 25-42). Respect to claim 6, Albridge teaches that the reflector is metal or semiconductor (col. 6 lines 53-58).

4. Claims 1-2, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Motley et al. (US 4,662,977).

Motley discloses a method comprising the steps of:

extracting an ion beam from an ion source to accelerate the ion beam (col. 4 lines 60-63, Fig 1);

reflecting an accelerated ion beam by a reflector (50) to neutralize ion beam (Fig 1, col. 2-4);

positioning a substrate to be etched (46 or 48 or 49) in a path of a neutral beam to etch a material layer on the substrate (Fig 1).

Motley does not explicitly disclose that the ion beam has a predetermined polarity. Polarity of a beam is the property of the beam itself. According to MPEP 2112.01, products of identical chemical composition cannot have mutually exclusive properties. Therefore, if the prior art teaches the identical chemical structure (i.e. ion beam), the properties applicant discloses and/or claims are necessarily present. The examiner will interpret that an ion beam must inherently have some polarity value.

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Respect to claim 2, Motley teaches to adjust the angle of incidence of the ion beam on the reflector before the reflecting (Fig 1, col. 3 line 64 to col. 4 line 6). Respect to claim 6, Motley teaches that the reflector (50) is metal (col. 3 lines 31-40).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Albridge Jr. et al. (US 4,775,789).

Respect to claim 3, Albridge fails to explicitly disclose the angle of the incidence of the ion beam on the reflector from a vertical line to a horizontal surface of the reflector. However, Albridge clearly teaches the angle of the incidence ( $\theta$ ) of the ion beam on the reflector from a horizontal line to a horizontal surface of the reflector (See

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Fig 1). Any person has ordinary skill in the art would be able to calculate the angle of the incidence of the ion beam on the reflector from a vertical line to a horizontal surface of the reflector by subtracting  $\theta$  from  $90^\circ$  ( $90^\circ - \theta$ ). Claim 3 differs from the cited prior art by the specific angle value. Albridge clearly discloses the angle of incident of the ion beam is a result effective variable. The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, It would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain optimal angle value as an expected result.

Respect to claim 4, Albridge teaches to adjust the gradient of the reflector to an incident beam (Fig 3, col. 3 line 55 to col. 4 line 20).

8. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motley.

Respect to claim 3, Motley fails to explicitly disclose value of the angle of the incidence of the ion beam on the reflector from a vertical line to a horizontal surface of the reflector. However, Motley clearly teaches the angle of the incidence is a result effective variable. The result effective variable is commonly determined by routine experiment. The process of conducting routine experiments so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to obtain optimal angle value as an expected result.

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Respect to claim 4, Motley teaches to adjust the gradient of the reflector to an incident beam (Fig 1). Respect to claim 5, Motley teaches to applying a voltage (via bias 54) to the reflector (50) to adjust a path of the incident ion beam (Fig 1a, Fig 1, col. 3).

**Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran  
August 22, 2003

NADINE G. NORTON  
PRIMARY EXAMINER

